FNBC Mathematical Appendix - Formulas

FNBC Mathematical Appendix - Core Formulas

1. Power Output Scaling:

   FNBC_power = BV100_power * (Fractal_Efficiency_Gain ^ Layers)

   Example:

   FNBC_power = 100 uW * (1.6 ^ 5) ~ 1,048.6 uW

2. Total Energy Over Time:

   Energy_Wh = Power_W * Hours

   Example:

   Energy_Wh = 0.0010486 W * (24 * 365 * 50) ~ 459.29 Wh

3. Voltage in Series:

   V_total = V_single * N_units_series

   Example:

   V_total = 3V * 10 = 30V

4. Required FNBC Units for Load:

   N_units = Load_W / FNBC_output_W

   Example:

   N_units = 100 W / 0.0010486 ~ 95,365 units

5. Fractal Scaling Model (Power):

   $P(n) = P_0 * r^n$

   Where:

   $P(n)$ = power at layer n

   P_0 = base unit power

   r = efficiency multiplier per layer

   n = number of layers

6. Energy Capacity over X Years:

Energy_X_Years = Power_W * 8760 hours/year * X

Example:

0.0010486 * 8760 * 50 ~ 459.29 Wh

These formulas govern the core logic behind FNBC's design and performance. They apply to both scaling forecasts and physical validation efforts.